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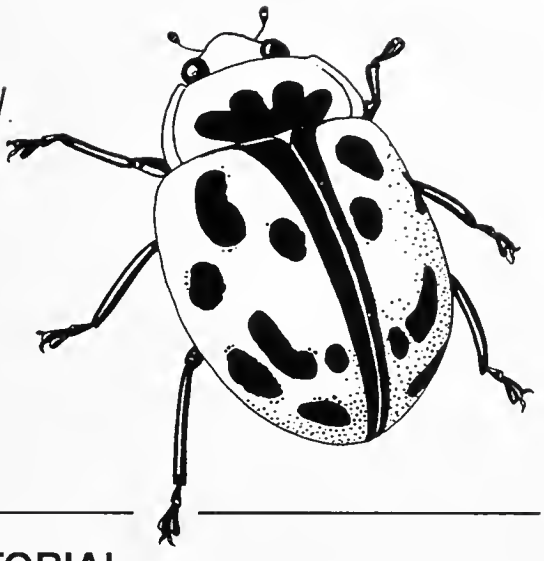

No. 61, February 2010

EDITORIAL

As this issue of *ICN* goes to press in early January, a spell of unusually cold winter weather is affecting many countries of the Northern Hemisphere, including the UK. Lest the freezing conditions might provoke irrational scepticism about climate change, meteorologists have been emphasising the difference between weather (i.e. the fluctuating conditions that we experience from day-to-day or year-to-year) and climate (i.e. the average and range of temperature, precipitation, wind-speed etc., as determined over many years).

Although climate is usually defined by long-term average values, it is characterised also by the long-term range of weather conditions, including the magnitude, frequency and seasonal timing of peaks and troughs. These patterns are important in determining the range of invertebrates that occur in a given region. For example, in regions with relatively low average temperatures, certain species are able to complete critical phases of development and dispersal when the temperature or insolation are above average. They are favoured also by localities with a warm micro-climate. On the other hand, there are species that fail to persist continuously in regions where conditions are favourable for much of the time but are punctuated by unfavourable weather events.

It remains to be seen whether the distributions of any invertebrates will be severely reduced by the very cold weather that has been occurring widely during the 2009-10 northern winter. It is possible that reversals will occur in the range-expansions that certain species have been showing in recent years. In Britain, such expansions have occurred among various species that were formerly confined to southernmost areas. These include the Wasp spider *Argiope bruennichi* and the Long-winged conehead *Conocephalus discolor*.

Although a species could die out from sites near the edge of its geographical range owing to an extreme weather event, it could equally re-colonise those sites if they remain suitable and if the species has sufficient mobility. The prospects of re-colonisation can, however, be limited by barriers, whether these are natural (e.g. mountain ranges, oceans or deserts) or artificial (e.g. large expanses of land where human activities have destroyed potential habitats).

Given that highly mobile species have relatively good prospects of re-colonising areas after extinction events, it might seem logical to focus conservation efforts on others that have very limited mobility. This often happens but perhaps the reason for selecting such species is that they are rare or declining, rather than because they are assessed as having limited mobility. In contrast, certain species might occur as rarities outside their main geographic ranges by virtue of high mobility, which has enabled them to establish colonies in isolated patches of suitable habitat. Such a colony could become extinct if the habitat becomes unsuitable (e.g. because of vegetational succession), or if there is an adverse weather event. There is scope for debate as to whether such an extinction should be regarded with any more concern than the colonisation event that preceded it. The rationale for striving strenuously to prevent the extinction is therefore open to question.

Preventive action might be practicable for a species which can tolerate a wide climatic range but whose habitats are mainly confined to regions with a narrower climatic range. A possible example of such a species is the White-faced darter dragonfly *Leucorrhinia dubia*, which is restricted to sphagnum bog pools. These are frequent in boreal and montane regions of northern Europe, but less so in more southerly and lowland regions, partly for reasons of geology and climate but also because of drainage for forestry and other land uses. When *L. dubia* died out at its most southerly British site in Thursley Common, Surrey, there were arguments that more effort should have been made to manage the site in order to maintain the habitat. Such cases do, however, raise fundamental questions about the dividing line between the conservation of naturally developing habitats and habitat 'gardening'.

NEWS, VIEWS AND GENERAL INFORMATION

International Year of Biodiversity

The United Nations has declared 2010 to be the International Year of Biodiversity (IYB); a celebration of "*the diversity of life on Earth, including every plant, animal and micro-organism*". This initiative is being run internationally under the Convention on Biological Diversity (CBD), which was set up after the Rio Earth Summit in 1992 with the intention of ensuring the conservation and sustainable use of biodiversity. Nearly 200 countries have signed up to the Convention, thereby promising to achieve a significant reduction of the rate of biodiversity loss at the global, regional and national level by 2010. A Biodiversity Summit is scheduled in October 2010 at Nagoya, Japan, when each country is due to report its progress towards achieving this target and making plans for the future.

In the UK, a wide range of organisations have been invited to become 'partners', in order to promote the understanding of biodiversity and to encourage people to get involved in monitoring and conserving their local wildlife. The partners include universities, media organisations and museums, theatre companies and artists. Recently, the AES has 'signed up' to be a partner. The Year is being marked by a series of international events, including conferences and a census of the diversity, distribution and abundance of life in the oceans.

Wider Countryside Butterfly Survey in the UK

In 2009, Butterfly Conservation (BC) launched a nationwide survey of butterflies in the wider countryside. The new survey is an extension of the UK Butterfly Monitoring Scheme (UKBMS), which is run by BC and the Centre for Hydrology and Ecology. Until now, butterfly monitoring in the UK has been focussed on nature reserves and butterfly-rich places, so that there is little information available from most of the wider countryside, including farmland, plantation woodland, uplands and urban green spaces.

Participants in the new survey are asked to make a minimum of two visits to a randomly selected grid square between May and August to count butterflies along two 1 km transects running roughly north-south through the square. Surveyors will have the support of a 'WCBS Champion' in each branch of BC. The aim is to survey 20 squares

within the area covered by each BC branch. Details of the scheme, including recording forms, can be found on the UKBMS website. Also, queries can be e-mailed to: survey@butterfly-conservation.org or made by telephone to: 01929 406036.

Proposed listing of *Buddleja davidii* as an invasive species in Britain

Buglife – The Invertebrate Conservation Trust has been seeking views as to whether there is a need to amend current British guidance on the status of *Buddleja davidii* as an invasive plant. In recent correspondence, Matt Shardlow, Chief Executive of Buglife, has mentioned that the Scottish Government has proposed the addition of *B. davidii* to the statutory list of invasive species in Schedule 9 of the Wildlife and Countryside Act 1981.

The vernacular English name of *B. davidii*, the Butterfly bush, perhaps epitomises the attitude of the many people who have planted it in order to attract butterflies to their gardens. On the other hand, by virtue of its ability to colonise bare ground very rapidly, its invasive qualities are self-evident. A native of China, it was introduced into the UK as a garden shrub at around 1890. It later became a familiar sight on the many bomb-sites that persisted for many years in Britain after World War Two. In more recent years, it has been colonising many 'brownfield sites', especially in the wake of the factory closures that have resulted from industrial decline.

The problem is that, by growing so vigorously on lime-rich urban brownfield sites, *Buddleja* often shades out important invertebrate habitats, which include the foodplants of many species and also the areas of bare and sparsely vegetated soil that are needed by many invertebrates, such as solitary bees and wasps. In its guidance on assessing the quality of brownfield sites, Buglife states that "*Despite its supposed popularity with butterflies, this invasive shrub quickly crowds out more important plants creating dense shade and nutrient-rich soil from its fallen and decomposing leaves.*" As has been often stated in *ICN* and its precursor bulletins over the last forty years, brownfield sites provide valuable invertebrate habitats. In recent years, their relative importance for biodiversity has increased, owing to the intensification of land use in the countryside, and yet they have increasingly been targeted for urban development. If the value of surviving habitats is being diminished by an invasion of *Buddleja*, there is clearly cause for concern.

There is concern about *Buddleja* not only on brownfield sites but also in areas where open habitats occur naturally. Matt Shardlow cites an example where Buglife has been working jointly with Butterfly Conservation to remove a very dense and spreading colony of *Buddleja* from a soft rock cliff on the south coast of Britain. He concedes that, on the other hand, the problem is patchy and that there might be very few cases of really important sites being adversely affected by *Buddleja*. Buglife would like to hear from anyone who knows of any such cases at named sites, since there is currently little information available.

Although *Buddleja* can cause a problem by shading, its value as a nectar source is widely acclaimed. In gardens, where it is usually kept under control, it can be regarded as being beneficial on balance, especially if other habitat-features are provided, including larval foodplants for the butterflies that feed on *Buddleja* as adults. On the other hand, it could be argued that the planting of *Buddleja* as a nectar source should not be promoted if this would aid its further spread. Buglife has recently been considering whether there is sufficient evidence to justify doing more to advise people against planting. Buglife recognises, however, that such advice might be 'too late', since the species is already very widespread in the UK. Also, it can be argued that other rapid colonists, such as sallow *Salix* spp., birch *Betula* spp. or coarse grasses would have a similar effect in the absence of *Buddleja*. Another important consideration is that the statutory listing of *B. davidii* as an invasive species would place highly unwelcome restrictions on gardeners and suppliers.

SITES AND SPECIES OF INTEREST

The Lord Howe Island phasmid: an update

In *ICN* 35 there was a report on the rediscovery in 2001 of the Australian phasmid, *Dryocelus australis* (The Lord Howe Island phasmid or 'Land lobster'), which had been thought to have become extinct in 1918, owing to predation by the introduced Black rat *Rattus rattus*. It is a large, heavy-bodied and flightless stick-insect, of which

the females can reach 12 cm in length. The males are smaller but have longer and thicker antennae and greatly enlarged, spiny hind legs. Our report mentioned that a new discovery (of three individuals) had taken place on a rocky islet called Ball's Pyramid about 14 miles (23 km) from Lord Howe Island, where the pre-1918 colony had flourished. Previously, some dead specimens had been found on the Pyramid in the 1960s.

Our previous report mentioned a proposal to re-introduce *D. australis* to Lord Howe Island, and so a short update might now be of interest. According to the website of the Australian Department of the Environment, Water, Heritage and the Arts, 24 live individuals were found in a follow-up survey of Ball's Pyramid in March 2002 (Priddel *et al.*, 2003). The population size is unknown but it is assumed to be very small, since the individuals were found only within an area of 0.18 km^2. This is a terrace, which is kept moist by a seepage of water through a rock fissure. The remainder of the Pyramid appears to be dry and devoid of suitable habitat. The foodplant in this location is evidently the shrub *Melalenca howeana*, the only woody species on Ball's Pyramid. On the main island, pre-1918 sightings were made in forested areas, where the insects were found sheltering in trunk hollows of living trees, particularly those made by larvae of the Large Longicorn beetle *Agrianome spinicollis*. On Ball's Pyramid, the only shelter appears to be provided by hollows in debris from plants, which include several herbaceous species in addition to *M. howeana*.

In view of the extremely small size and apparently sub-optimal nature of the habitat on Ball's Pyramid, it seems likely that adverse conditions or events could easily cause the extinction of the species in the wild. These include the presence of Morning Glory *Ipomoea cairica*, an invasive vine, which is competing with the foodplant *M. howeana*. For this reason, all Morning Glory plants in the immediate vicinity of the phasmid population have been carefully removed (Priddel *et al.* 2003). Also there is evidence that seabirds might use the bodies of the insects as nest material (Smithers, 1970), but there is equally a possibility that birds flying between islands might disperse this flightless phasmid. Other perceived threats are potential rather than current; these could include illegal collection by unscrupulous collectors and the introduction of exotic animals such as rats, the Red Imported Fire Ant *Solenopsis invicta* or the Yellow Crazy Ant *Anoplolepsis graciliopes*. Climate change is also of concern, since it could lead to loss of habitat.

In consideration of the above threats to *D. australis*, the species is listed as Critically Endangered under the Australian Environment

Protection and Biodiversity Conservation Act 1999. It has similarly been categorised in the IUCN Red List of Threatened Species. Also, there is a nationally-approved recovery plan, which specifies various actions intended to reduce adverse factors. These actions include the restriction of access to Ball's Pyramid, the control of Morning Glory and the imposition of quarantine measures to prevent the introduction of alien species. There are also actions for the monitoring of the phasmid population on Ball's Pyramid, maintaining captive breeding programmes and reintroduction of the phasmid to the main island. These actions were laid down in 2007 and were intended for implementation within three years.

In preparation for the proposed re-introduction to Lord Howe Island, a captive population of several dozen breeding adults has been established at Melbourne Zoo, under the terms of the Lord Howe Island Biodiversity Management Plan, (DECC, 2007). This population was initiated in 2003 from a pair of adults taken from the wild.

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Castlemartin Range, south-west Wales

The Castlemartin Range, owned by the UK Ministry of Defence (MoD) in Pembrokeshire, SW Wales, occupies about 2,400 hectares (5,900 acres), along a 14 km (8.7 mile) length of coastal cliff and extends up to 3.5 km inland. The Range often features in the MoD's wildlife conservation magazine, *Sanctuary*, by virtue of its great diversity of invertebrates, many of which are rare or endangered and for which the Range is one of their remaining British strongholds. These include the Marsh fritillary butterfly *Euphydryas aurinia*, the Shrill carder bee *Bombus sylvarum* and the Strandline carabid beetle *Nebria complanata*.

The 2009 edition of *Sanctuary* includes a report by Guy Knight of the Liverpool National Museums, whose team of entomologists has been working with the MoD, the Countryside Council for Wales and

Landmarc Support Services in order to survey invertebrates in the Range. The report covers three main habitat-areas: soft cliffs, sand dunes and grassland.

Soft rock cliffs provide very important habitats for invertebrates in the UK and have therefore been the subject of one of the main projects of Buglife – The Invertebrate Conservation Trust. By undergoing gradual erosion, they provide patches of bare ground that many invertebrates require for nesting or for hunting. Erosion also allows the continued presence of ruderal plants and their associated invertebrates. Soft cliffs often also contain freshwater springs or seepages, which provide a further range of habitats for many specialised invertebrates.

As mentioned in *ICN* 35, the special habitats associated with soft rock cliffs are often under threat from engineering works intended to prevent coastal erosion. The use of the Castlemartin Range for military training has allowed the slow erosion of the soft rock cliffs to occur without undue interference, thus favouring many invertebrates that are threatened elsewhere. On the sparsely vegetated cliff faces at Castlemartin, the species mentioned in Guy Knight's report include the Long-horned mining bee *Eucera longicornis*, the weevil *Sitona waterhousei* (a Nationally Scarce species, which feeds on Bird's-foot trefoil *Lotus corniculatus*) and the squashbug *Enoplops scapha*, which feeds on composites. With regard to seepages, he mentions examples at Great and Little Furzenip, which support species such as the cranefly *Dicranomyia goritiensis* and the caddisfly *Limnephilus hirsutus*.

With regard to Castlemartin's sand dune systems, which cover more than 430 ha (1060 acres), Guy Knight reports that the survey has been particularly concerned with shield-bugs, bees, wasps and ants. Like the soft cliffs, the dune systems include bare or sparsely vegetated areas. Some of these occur naturally, while others are created by military activities and by the grazing of livestock and rabbits. There is also a vegetational succession, progressing through grassland and scrub, which provides a range of distinct habitats.

As mentioned in *ICN* 49, the invertebrates recorded on the sparsely vegetated dunes include the Red Data Book (RDB) shield-bug *Odontoscelis fuliginosa*, which is associated with Stork's bill *Erodium* spp. and other plants. Another RDB species of these open areas is the seed bug *Pionosomus varius*, which is associated with Little Mouse Ear *Cerastium semidecandrum*, Biting Stonecrop *Sedum acre*, Common Stork's-bill *Erodium cicutarium* and Shepherd's Purse *Capsella bursa-pastoris*. In these areas, 102 Hymenoptera have also been recorded; these include species that nest in warm sandy banks and slopes, such

as the solitary wasps *Oxybelus argentatus*, *Podalonia hirsuta*, *Dryudella pinguis* and *Tachysphex nitidulus* and the leaf-cutter bee *Megachile dorsalis*.

The beach next to one of the main sand dune systems, Limney Burrows, provides important habitats associated with driftwood, large amounts of which have been allowed to accumulate. At many other beaches in the UK, local authorities routinely remove such material for the sake of amenity, together with accumulated seaweed. In a recent review by David Sheppard and Adrian Fowles on behalf of Natural England (see *ICN* 60), this practice has been identified as a threat to invertebrate habitats. Guy Knight reports that the driftwood at Limney Burrows supports a suite of interesting insects, including the weevil *Pselactus spadix*, the solitary wasp *Ectemnius sexcinctus*, which nests in dead wood in sunny places, and the cuckoo bee *Stelis ornatula*, a nest parasite of bees living in dead wood.

As mentioned in *ICN* 36, the very large area of unimproved grassland at Castlemartin supports a number of bumblebees that have seriously declined across most of the UK. These include the Shrill carder bee, *Bombus sylvarum* and the Brown-banded bumblebee *Bombus humilis*. There are also various Lepidoptera that have similarly declined elsewhere, including the Marsh fritillary *Euphydryas aurinia* and the Silver-studded blue *Plebejus argus*. In his report, Guy Knight states that these grasslands represent the largest area of its type in lowland Wales known to be free from intensive management. Also, he points out that they include a significant proportion of the total Welsh resource of certain limestone and neutral grassland communities.

Having been set aside for military use, the grasslands, like the other kinds of habitat at Castlemartin, have escaped many of the adverse changes that have widely affected the British countryside. Also, military activities, including tank movements and the excavation or burning of localised areas for exercises, have provided a range of important habitats associated with bare soil and sparse vegetation. Guy Knight reports that, following the most recent surveys, in 2007 and 2008, the number of species recorded from a small selection of flower-rich neutral and limestone grassland areas has reached 713, including 27 with RDB or Nationally Scarce status. They include a range of mining bees, some of which have been recorded in the limestone grasslands but not in other parts of the Range. One of these is *Andrena hattorfiana*, an RDB species, which has declined severely in Britain and was not previously known from Pembrokeshire.

The Tooth Cave pseudoscorpion in Texas, USA

Pseudoscorpions rarely feature in publicity about endangered invertebrates, perhaps because they are very small and inconspicuous and perhaps also because there are few specialists who can identify them. Like true scorpions, they belong to the Class Arachnida and have pincer-like appendages (pedipalps) with which they grasp invertebrate prey. Their pedipalps are equipped with poison glands but they lack the stinging 'tail' that is characteristic of true scorpions.

In the USA, the Tooth Cave pseudoscorpion *Tartarocreagris texana* has been listed as Endangered since 1988. According to the Cornell University website, it is found only in the Edwards Plateau, Travis County, Texas, a limestone karst area, in which caves have been formed as a result of calcium carbonate being gradually dissolved by percolating groundwater. This species is threatened, together with many others, by loss of habitat caused by urban development, quarrying and mining. These changes have involved the paving-over or filling-in of many caves. Other caves have been affected by pollution or altered so that they no longer provide the stable temperatures and high humidity required by the cave fauna. Also, the Red Imported Fire Ant *Solenopsis invicta* was introduced in 1988 and has become a further cause for concern by preying upon the pseudoscorpion and affecting its habitat.

In an article about the karst system at Edwards Plateau, Roberts (2000) provides information about five other invertebrates of the caves, which are classed as Endangered. These are the Tooth Cave spider *Neoleptoneta myopica*, the Bee Creek Cave harvestman *Texella reddelli*, the Bone Cave harvestman *Texella reyesi*, the Kretchmarr Cave mould beetle *Texamaurops reddelli* and the Tooth Cave ground beetle *Rhadine persephone*.

Since 1994 there has been a recovery plan, which includes survey, research and education, together with the protection and management of selected habitat sites. Specific measures include a Fire ant control study, land acquisition, cooperative agreements and cave gating.

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RESEARCH NOTES

Invertebrate dispersal between protected habitats and adjacent farmland

Porton Down in Wiltshire, southern England, includes the UK's largest remaining tract of chalk downland undisturbed by cultivation. An area of about 7,000 acres (2,830 ha) is controlled by the Ministry of Defence (MoD) around its Science and Technology Laboratory, which was established in 1916. The uncultivated part of the land, which occupies almost half of the total, has been a Site of Special Scientific Interest (SSSI) since 1977 and is well known for its outstanding biodiversity. Since the SSSI is adjacent to areas of the estate where conventional intensive agriculture is practised, there are opportunities to make comparative studies of the fauna and flora. In particular, it is interesting to know whether the adjacent farmland is richer in species than it might be if it were not adjacent to the SSSI.

In September and October 2008, Stuart Corbett, the Conservation Officer at Porton Down, recorded spiders and ground beetles (carabids) by pitfall trapping on the SSSI and on adjacent areas used for intensive sheep grazing and arable farming. Writing in the 2009 edition of the MoD's *Sanctuary* magazine (No. 38), he reports having found many more species on the SSSI than on the adjacent farmland. These included Nationally Notable species such as the beetles *Panagaeus bipustulatus* and *Amara equestris* and the spiders *Ozyptila nigrita* and *Zelotes* (*Drassylus*) *praeficus*. Over half of the spider species were typical of calcareous grasslands. He concludes that many of the rare and specialised species were formerly present beyond the limits of the current SSSI, until the introduction of modern agricultural practices more than 30 years ago.

Stuart Corbett considers that regular and deep cultivation in the farmland has wiped out many of the species still present on the SSSI but he points out that it has also produced a much deeper humus-rich soil, which favours species that are not well suited to the shallow and dry soil of the SSSI. These include the common carabid *Nebria brevicollis*, which was much more abundant on the farmland than on the SSSI. This was one of a very few species that were found on both sides of the SSSI boundary; another was the widespread *Calathus fuscipes*. In the sheep-grazed area, where species-richness had been reduced by factors such as conversion to a grass monoculture and an increased intensity of grazing, only six carabid species were found. None of these carabids was, however, found on the arable land, while

only one of them, *Carabus problematicus*, was found on the SSSI. The spiders that occurred on both sides of the SSSI fence were all ubiquitous species.

The study did not show any evidence that the species-richness of the intensively farmed area was being enhanced by any 'spill-over' of species from the adjacent SSSI. The apparent absence of any such enrichment probably demonstrates that relatively specialised species are unlikely to colonise unfavourable sites, even if they can move across boundaries. Having found certain species that conversely seemed to be restricted to the farmland at Porton, Stuart Corbett stresses that sites should not be undervalued merely because they have been intensively modified. He adds, however, that most of the species on the Porton farmland are highly adaptable to disturbance and are widespread in England. Also, he expresses caution about the idea that an arable field can readily be converted into a wildflower meadow. He points out that the appearance of flowers, butterflies and skylarks after re-seeding such a field can be superficial and that it would be "a very long time" before the suite of ground-dwelling invertebrates might come to resemble that of an undisturbed grassland (although probably less so at Porton Down, where they could migrate from the adjacent SSSI).

Pollinating insects in relation to EU agricultural policy

The current decline in the abundance and diversity of pollinators is of concern both for biodiversity and for agriculture (see *ICN* 59). According to a report from the European Commission (DG, 2009), an Estonian research group has ranked the key factors in the decline of bees and other pollinating insects (Kuldna *et al.* 2009). The study involved the use of an analytical method known as the DPSIR framework (Driving forces-Pressures-State-Impact-Responses). It took place under a EU project entitled "*Assessing large-scale environmental risks for biodiversity with tested methods*".

By analysing data from a range of previous studies, the Estonian group concluded that land-use practices, such as intensified agriculture, overgrazing and landscape fragmentation, were causing the strongest negative pressure on pollinators. Agrochemicals were considered the second strongest pressure, followed by the introduction of genetically modified crops. Other factors included in the analysis were parasites and diseases, competition between species (caused by humans) and climate change. Bees were found to be affected more than other

pollinators by all the adverse factors other than climate change, which was found to have the greatest adverse effect on butterflies. The study therefore indicates that populations of bees and other pollinators could be helped by reducing the use of agrochemicals, increasing the areas of flower-rich natural grasslands and of leguminous crops and maintaining the diversity of landscapes.

The EC report appraises the findings of the study in relation to land-use practices in EU countries, which are influenced strongly by the Common Agricultural Policy (CAP). As discussed in previous issues of *ICN* (e.g. *ICN* 39 and 42) the CAP has been modified in recent years, in order to help redress the long-standing bias towards environmentally harmful agricultural intensification. The main change in the CAP has been the inclusion of 'agri-environment measures' in the CAP, which are aimed at supporting specific farming practices that protect the environment and maintain the countryside. The report points out, however, that these measures account for only 8 per cent of the total CAP budget for 2007-2013 and that each Member State implements them differently. The report also refers to previous research, which has shown that these measures have had some positive impact on pollinators, albeit on common species rather than endangered species. The most beneficial measures have been those that help to increase landscape diversity, for example through organic farming. According to the Estonian team, there should be a substantial increase in the percentage of the CAP allocated to such measures.

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CORRIGENDUM

ICN No. 60

In the *ICN* review of a leaflet on aspen as an insect foodplant, published by Butterfly Conservation, a beetle was incorrectly named as *Byctiscus betulae*. The correct species, as named in the leaflet, was its close relative *B. populi*, which occurs mostly on poplars, including aspen. Thanks are due to Ched George for drawing attention to the error.

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